# ENSF 338 Lab 3

Group 35

Exercise 2

Q 3) Included in the diagrams below are plots for the best, worst and average case of both bubble sort and quick sort.

In the bubble sort, all three cases have a time complexity of $O(n^2)$ as seen by the curve. However, the worst case had a steeper rise, followed by the average case and then the best case. This is the predicted behaviour as the best case should perform better then the average case which should outperform the worst case.

In the quick sort, the best and average case have a complexity of $O(n \log(n))$ while the worst case has a time complexity of $O(n^2)$.

In general, the quick sort algorithm takes way less time than the bubble sort as seen from the scale.
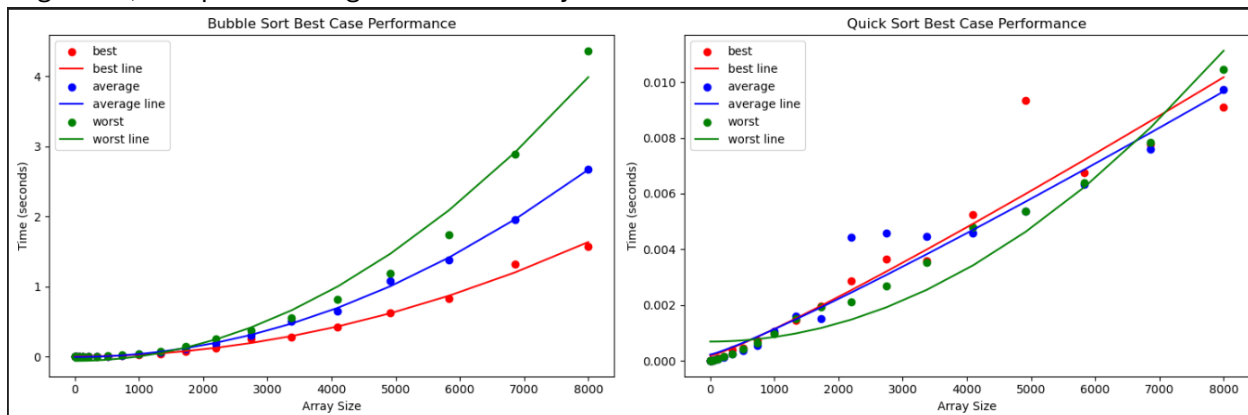
Q 4) From the diagrams above and additionally the one below, I would choose 1000 arrays as the threshold size for a small array. I believe that at that size, the time bubble sort takes begins to ramp up rapidly. So at 0 – 1000 array elements, a bubble sort should perform similar to a quick sort.

Sorting Performance